

**Claims:**

1. (Previously presented) A system for integrating Web Services with business systems, comprising:

a processor; and

a memory comprising program instructions, wherein the program instructions are executable by the processor to implement a Web Services architecture design service configured to generate integrated Web Service architectures for integrating Web Services with business systems, wherein, to generate an integrated Web Service architecture for integrating a specific Web Service with a specific business system, the program instructions are executable by the processor to:

generate the integrated Web Service architecture comprising a plurality of heterogeneous components of the specific business system in accordance with one or more Web Services integration design patterns for integrating Web Services with business systems, wherein, to generate the integrated Web Service architecture, the program instructions are executable by the processor to:

generate one or more Use Cases for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein each Use Case models a particular business scenario for the integrated Web Service;

generate a high-level architecture for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein the high-level architecture identifies two or more entities of the integrated Web

Service and the relationships and interactions among the entities; and

generate a logical architecture for the integrated Web Service according to the business scenarios modeled by the one or more Use Cases and in accordance with the one or more Web Services integration design patterns, wherein the logical architecture identifies two or more logical components of the integrated Web Service and the relationship among the two or more logical components according to a plurality of integration tiers, and wherein the logical architecture comprises two or more layers; and

provide output indicating the generated integrated Web Service architecture for integrating the specific Web Service with the specific business system.

2. (Previously presented) The system as recited in claim 1, wherein, to generate the integrated Web Service architecture, the program instructions are further executable by the processor to:

define the plurality of integration tiers, one or more basic components, and one or more Web Services technologies for integration; and

define how each of the plurality of integration tiers communicates with others of the plurality of integration tiers.

3. (Previously presented) The system as recited in claim 1, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

4. (Previously presented) The system as recited in claim 1, wherein, to generate the integrated Web Service architecture, the program instructions are further executable by the processor to:

define one or more Web Services technologies for integration; and

define integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

5. (Original) The system as recited in claim 1, wherein the business system is an Enterprise business system.

6. (Original) The system as recited in claim 1, wherein the business system is a Cross-Enterprise business system.

7. (Original) The system as recited in claim 1, wherein the plurality of heterogeneous components of the business system includes one or more legacy mainframe systems.

8. (Original) The system as recited in claim 1, wherein the integrated Web Service architecture comprises:

a service provider configured to provide one or more services on an integrated Web Service business system implemented according to the integrated Web Service architecture; and

one or more service requesters configured to access the one or more services from the service provider via a network.

9. (Original) The system as recited in claim 8, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider

is a business service provider, and wherein the service requester is an end user.

10. (Original) The system as recited in claim 8, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

11. (Previously presented) The system as recited in claim 1, wherein the Web Services integration design patterns include one or more Mainframe integration and interoperability design patterns.

12. (Original) The system as recited in claim 11, wherein the Mainframe integration and interoperability design patterns include one of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

13. (Canceled)

14. (Previously presented) The system as recited in claim 1, wherein the Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern; and

a Data Exchange design pattern.

15. (Previously presented) The system as recited in claim 1, wherein the Web Services integration design patterns include one of a Closed Process integration design pattern and an Open Process integration design pattern.

16. (Previously presented) The system as recited in claim 15, wherein the Web Services integration design patterns include one of a Service Consolidation–Broker integration design pattern and a Reverse Auction–Broker integration design pattern.

17. (Previously presented) The system as recited in claim 1, wherein the two or more layers comprise two or more of:

- a network layer configured to serve as an underlying network for integrated Web Services implemented according to the integrated Web Service architecture;

- a transport layer for delivering messages between components of the integrated Web Services;

- a service description language layer configured to describe service type and functionality of the integrated Web Services;

- a transaction routing layer configured to route messages on the transport layer;

- a service discovery layer configured to search for and locate the integrated Web Services;

- a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;

- a management layer configured for provisioning of the integrated Web Services

and for monitoring and administration of the integrated Web Services;

a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Services;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

18. (Previously presented) A system for generating integrated Web Service architectures, comprising:

a processor; and

a memory comprising program instructions, wherein the program instructions are executable by the processor to implement a Web Services architecture design service configured to generate integrated Web Service architectures for implementing integrated Web Service business systems, wherein, to generate an integrated Web Service architecture for implementing a specific integrated Web Service business system, the program instructions are executable by the processor to:

identify one or more logical components of the integrated Web Service architecture according to one or more use case requirements for the specific integrated Web Service business system, wherein each use case requirement specifies a particular business scenario for the integrated Web Service business system;

translate the one or more use case requirements for the specific integrated Web Service business system and one or more technical constraints for the specific integrated Web Service business system to determine a plurality of Web Service components for the integrated Web Service architecture, wherein the Web Service components include software components;

categorize the Web Service components into two or more related groups according to a Web Services architecture integration framework;

define a plurality of integration tiers for the integrated Web Service architecture and one or more Web Services technologies for the integrated Web Service architecture according to the Web Services architecture integration framework;

define how each of the plurality of integration tiers communicates with others of the plurality of integration tiers in the integrated Web Service architecture according to the Web Services architecture integration framework;

organize the groups of Web Service components according to the plurality of integration tiers and two or more layers of the integrated Web Service architecture;

apply one or more design patterns to the integrated Web Service architecture, wherein the one or more design patterns include one or more Web Services integration design patterns for integrating Web Services with business systems; and

provide output indicating the generated integrated Web Service architecture for implementing the specific integrated Web Service business system.

19. (Previously presented) The system as recited in claim 18, wherein the integrated Web Service architecture comprises:

a service provider configured to provide one or more services on the integrated Web Service business system implemented according to the integrated Web Service architecture; and

one or more service requesters configured to access the one or more services from the service provider via a network.

20. (Original) The system as recited in claim 19, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

21. (Original) The system as recited in claim 19, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

22. (Previously presented) The system as recited in claim 18, wherein the two or more layers of the integrated Web Service architecture comprise two or more of:

a network layer configured to serve as an underlying network for Web Services implemented according to the integrated Web Service architecture;

a transport layer for delivering messages between components of the integrated Web Service architecture;

a service description language layer configured to describe service type and



- functionality of the integrated Web Service architecture;
- a transaction routing layer configured to route messages on the transport layer;
- a service discovery layer configured to search for and locate services in the integrated Web Service architecture;
- a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;
- a management layer configured for provisioning of the integrated Web Service architecture and for monitoring and administration of the integrated Web Service architecture;
- a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Service architecture;
- a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and
- an Open Standards layer.

23. (Previously presented) The system as recited in claim 18, wherein the specific integrated Web Service business system is an Enterprise integrated Web Service.

24. (Previously presented) The system as recited in claim 18, wherein the specific integrated Web Service business system is a Cross-Enterprise integrated Web Service.

25. (Previously presented) The system as recited in claim 18, wherein the plurality of Web Service components of the integrated Web Service architecture include one or more legacy mainframe systems.

26. (Original) The system as recited in claim 18, wherein the program instructions are further executable by the processor to define integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

27. (Previously presented) The system as recited in claim 18, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

28. (Previously presented) The system as recited in claim 18, wherein the one or more Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern; and

a Data Exchange design pattern.

29. (Original) The system as recited in claim 18, wherein the design patterns include one of a Closed Process integration design pattern and an Open Process integration design pattern.

30. (Original) The system as recited in claim 18, wherein the design patterns include one of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

31. (Previously presented) An integrated Web Services business system, comprising:

one or more computers configured to implement:

a plurality of heterogeneous business components of the integrated Web Services business system;

a plurality of integration tiers of the integrated Web Services business system, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier; and

an integrated Web Service comprising one or more Web Services technologies for the integrated Web Services business system, wherein the integrated Web Service is configured to provide interoperability among the plurality of heterogeneous business components via a network;

wherein the integrated Web Services business system is configured and implemented according to an integrated Web Service architecture generated by a computer-implemented integrated Web Services architecture design service according to a structured integration

methodology for designing and generating integrated Web Service architectures for integrating Web Services technologies with business systems comprising heterogeneous components such that:

the plurality of heterogeneous business components are organized according to the plurality of integration tiers and two or more layers of the integrated Web Service architecture; and

one or more design patterns including one or more Web Services integration design patterns for integrating Web Services with business systems are applied to the integrated Web Service architecture, wherein each design pattern models a particular structure that is applicable to the integrated Web Service.

32. (Original) The system as recited in claim 31, wherein the integrated Web Services business system further comprises one or more Enterprise Application Interface (EAI) products integrated with the one or more Web Services technologies.

33. (Canceled)

34. (Original) The system as recited in claim 31, wherein the integrated Web Services business system is an Enterprise business system.

35. (Original) The system as recited in claim 31, wherein the integrated Web Services business system is a Cross-Enterprise business system.

36. (Original) The system as recited in claim 31, wherein the plurality of heterogeneous business components includes one or more legacy mainframe systems.

37. (Previously presented) The system as recited in claim 31, wherein the integrated Web Services business system further comprises:

a service provider configured to provide one or more services on the integrated Web Services business system; and

one or more service requesters configured to access the one or more services from the service provider via the network.

38. (Original) The system as recited in claim 37, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

39. (Original) The system as recited in claim 37, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

40. (Original) The system as recited in claim 31, wherein the design patterns include one of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

41. (Original) The system as recited in claim 31, wherein the design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern;

- a Data Exchange design pattern;
- a Closed Process integration design pattern;
- an Open Process integration design pattern;
- a Service Consolidation–Broker integration design pattern; and
- a Reverse Auction–Broker integration design pattern.

42. (Previously presented) A system for integrating Web Services with business systems, comprising:

computer-implemented means for generating an integrated Web Services architecture for integrating a Web Service with a business system comprising a plurality of heterogeneous components;

computer-implemented means for applying a Web Services structured methodology and one or more design patterns to the generated integrated Web Service architecture to identify a plurality of integrated Web Service components including one or more of the business system components and to organize the integrated Web Service components according to the integrated Web Service architecture, wherein the plurality of integrated Web Service components are organized according to two or more integration tiers and two or more layers of the integrated Web Service architecture;

wherein said computer-implemented means for applying a Web Services structured methodology and one or more design patterns to the generated

integrated Web Service architecture comprises means for providing integration and interoperability with the integrated Web Service architecture for existing business functionality of the business system;

computer-implemented means for providing output indicating the generated integrated Web Service architecture for integrating the Web Service with the business system; and

means for implementing the integrated Web Service comprising the plurality of integrated Web Service components organized according to the integrated Web Service architecture.

43. (Original) The system as recited in claim 42, wherein the business system is one of an Enterprise business system and a Cross-Enterprise business system.

44. (Previously presented) The system as recited in claim 42, wherein the plurality of integrated Web Service components includes one or more legacy mainframe systems of the business system.

45. (Previously presented) A method for integrating Web Services with business systems, comprising:

generating, by an integrated Web Services architecture design mechanism implemented on one or more computers and in accordance with one or more Web Services integration design patterns for integrating Web Services with business systems, an integrated Web Service architecture for integrating a specific Web Service with a specific business system, wherein the integrated Web Service architecture comprises a plurality of heterogeneous components of the specific business system, wherein said generating an integrated Web Service architecture comprises:

generating one or more Use Cases for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein each Use Case models a particular business scenario for the integrated Web Service;

generating a high-level architecture for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein the high-level architecture identifies entities of the integrated Web Service and the relationships and interactions among the entities; and

generating a logical architecture for the integrated Web Service according to the business scenarios modeled by the one or more Use Cases and in accordance with the one or more Web Services integration design patterns, wherein the logical architecture identifies two or more logical components of the integrated Web Service and the relationship among the two or more logical components according to a plurality of integration tiers, and wherein the logical architecture comprises two or more layers;

providing output indicating the generated integrated Web Service architecture for integrating the specific Web Service with the specific business system; and

implementing the specific Web Service integrated with the specific business system according to the integrated Web Service architecture.

46. (Previously presented) The method as recited in claim 45, wherein said generating an integrated Web Service architecture comprises:



defining the plurality of integration tiers, one or more basic components, and one or more Web Services technologies for integration; and

defining how each of the plurality of integration tiers communicates with others of the plurality of integration tiers.

47. (Previously presented) The method as recited in claim 45, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

48. (Previously presented) The method as recited in claim 45, wherein said generating an integrated Web Service architecture further comprises:

defining one or more Web Services technologies for integration; and

defining integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

49. (Original) The method as recited in claim 45, wherein the business system is an Enterprise business system.

50. (Original) The method as recited in claim 45, wherein the business system is a Cross-Enterprise business system.

51. (Original) The method as recited in claim 45, wherein the plurality of heterogeneous components of the business system includes one or more legacy mainframe systems.

52. (Original) The method as recited in claim 45, wherein the integrated Web Service architecture comprises:

a service provider configured to provide one or more services on an integrated Web Service business system implemented according to the integrated Web Service architecture; and

one or more service requesters configured to access the one or more services from the service provider via a network.

53. (Original) The method as recited in claim 52, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

54. (Original) The method as recited in claim 52, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

55. (Previously presented) The method as recited in claim 45, wherein the Web Services integration design patterns include one of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

56. (Previously presented) The method as recited in claim 45, wherein the Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern;

- a Data Exchange design pattern;
- a Closed Process integration design pattern;
- an Open Process integration design pattern;
- a Service Consolidation–Broker integration design pattern; and
- a Reverse Auction–Broker integration design pattern.

57. (Previously presented) The method as recited in claim 45, wherein the two or more layers comprise two or more of:

- a network layer configured to serve as an underlying network for integrated Web Services implemented according to the integrated Web Service architecture;
- a transport layer for delivering messages between components of the integrated Web Services;
- a service description language layer configured to describe service type and functionality of the integrated Web Services;
- a transaction routing layer configured to route messages on the transport layer;
- a service discovery layer configured to search for and locate the integrated Web Services;
- a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;

a management layer configured for provisioning of the integrated Web Services and for monitoring and administration of the integrated Web Services;

a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Services;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

58. (Previously presented) A method for generating integrated Web Service architectures, comprising:

identifying, by an integrated Web Services architecture design mechanism implemented on one or more computers, one or more logical components of an integrated Web Service architecture for implementing a specific integrated Web Service business system according to one or more use case requirements for the specific integrated Web Service business system, wherein each use case requirement specifies a particular business scenario for the integrated Web Service business system;

translating, by the integrated Web Services architecture design mechanism, the one or more use case requirements for the specific integrated Web Service business system and one or more technical constraints for the specific integrated Web Service business system to determine a plurality of Web Service components for the integrated Web Service architecture, wherein the Web Service components include software components;

categorizing, by the integrated Web Services architecture design mechanism, the Web Service components into two or more related groups according to a Web Services architecture integration framework;

defining, by the integrated Web Services architecture design mechanism, a plurality of integration tiers for the integrated Web Service architecture and one or more Web Services technologies for the integrated Web Service architecture according to a Web Services architecture integration framework;

defining, by the integrated Web Services architecture design mechanism, how each of the plurality of integration tiers communicates with others of the plurality of integration tiers in the integrated Web Service architecture according to the Web Services architecture integration framework;

organizing, by the integrated Web Services architecture design mechanism, the groups of Web Service components according to the plurality of integration tiers and two or more layers of the integrated Web Service architecture;

applying, by the integrated Web Services architecture design mechanism, one or more design patterns to the integrated Web Service architecture, wherein the one or more design patterns include one or more Web Services integration design patterns for integrating Web Services with business systems; and

providing, by the integrated Web Services architecture design mechanism, output indicating the generated integrated Web Service architecture for implementing the specific integrated Web Service business system.

59. (Previously presented) The method as recited in claim 58, wherein the

integrated Web Service architecture comprises:

- a service provider configured to provide one or more services on the integrated Web Service business system implemented according to the integrated Web Service architecture; and

- one or more service requesters configured to access the one or more services from the service provider via a network.

60. (Original) The method as recited in claim 59, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

61. (Original) The method as recited in claim 59, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

62. (Previously presented) The method as recited in claim 58, wherein the two or more layers of the integrated Web Service architecture comprise two or more of:

- a network layer configured to serve as an underlying network for Web Services implemented according to the integrated Web Service architecture;

- a transport layer for delivering messages between components of the integrated Web Service architecture;

- a service description language layer configured to describe service type and functionality of the integrated Web Service architecture;

- a transaction routing layer configured to route messages on the transport layer;

- a service discovery layer configured to search for and locate services in the

integrated Web Service architecture;

a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;

a management layer configured for provisioning of the integrated Web Service architecture and for monitoring and administration of the integrated Web Service architecture;

a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Service architecture;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

63. (Previously presented) The method as recited in claim 58, wherein the specific integrated Web Service business system is an Enterprise integrated Web Service.

64. (Previously presented) The method as recited in claim 58, wherein the specific integrated Web Service business system is a Cross-Enterprise integrated Web Service.

65. (Previously presented) The method as recited in claim 58, wherein the plurality of Web Service components of the integrated Web Service architecture include one or more legacy mainframe systems.

66. (Original) The method as recited in claim 58, further comprising defining integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

67. (Previously presented) The method as recited in claim 58, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

68. (Previously presented) The method as recited in claim 58, wherein the one or more Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern;

a Data Exchange design pattern;

a Closed Process integration design pattern;

an Open Process integration design pattern;

a Service Consolidation–Broker integration design pattern; and

a Reverse Auction–Broker integration design pattern.



69. (Previously presented) A computer-accessible storage medium storing program instructions, wherein the program instructions are computer-executable to implement:

generating, in accordance with one or more Web Services integration design patterns for integrating Web Services with business systems, an integrated Web Service architecture for integrating a specific Web Service with a specific business system, wherein the integrated Web Service architecture comprises a plurality of heterogeneous components of the specific business system, wherein said generating an integrated Web Service architecture comprises:

generating one or more Use Cases for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein each Use Case models a particular business scenario for the integrated Web Service;

generating a high-level architecture for the integrated Web Service in accordance with the one or more Web Services integration design patterns, wherein the high-level architecture identifies entities of the integrated Web Service and the relationships and interactions among the entities; and

generating a logical architecture for the integrated Web Service according to the business scenarios modeled by the one or more Use Cases and in accordance with the one or more Web Services integration design patterns, wherein the logical architecture identifies two or more logical components of the integrated Web Service and the relationship among the two or more logical components according to a plurality of integration tiers, and wherein the logical

architecture comprises two or more layers; and

providing output indicating the generated integrated Web Service architecture for integrating the Web Service with the business system.

70. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein, in said generating an integrated Web Service architecture, the program instructions are further computer-executable to implement:

defining the plurality of integration tiers, one or more basic components, and one or more Web Services technologies for integration; and

defining how each of the plurality of integration tiers communicates with others of the plurality of integration tiers.

71. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

72. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein, in said generating an integrated Web Service architecture, the program instructions are further computer-executable to implement:

defining one or more Web Services technologies for integration; and

defining integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

73. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the business system is an Enterprise business system.

74. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the business system is a Cross-Enterprise business system.

75. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the plurality of heterogeneous components of the business system includes one or more legacy mainframe systems.

76. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the integrated Web Service architecture comprises:

a service provider configured to provide one or more services on an integrated Web Service business system implemented according to the integrated Web Service architecture; and

one or more service requesters configured to access the one or more services from the service provider via a network.

77. (Previously presented) The computer-accessible storage medium as recited in claim 76, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

78. (Previously presented) The computer-accessible storage medium as recited in claim 76, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

79. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the Web Services integration design patterns include one of a Synchronous Mainframe Web Services design pattern and an Asynchronous Mainframe Web Services design pattern.

80. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern;

a Data Exchange design pattern;

a Closed Process integration design pattern;

an Open Process integration design pattern;

a Service Consolidation–Broker integration design pattern; and

a Reverse Auction–Broker integration design pattern.

81. (Previously presented) The computer-accessible storage medium as recited in claim 69, wherein the two or more layers comprise two or more of:

a network layer configured to serve as an underlying network for integrated Web Services implemented according to the integrated Web Service architecture;

a transport layer for delivering messages between components of the integrated Web Services;

- a service description language layer configured to describe service type and functionality of the integrated Web Services;
- a transaction routing layer configured to route messages on the transport layer;
- a service discovery layer configured to search for and locate the integrated Web Services;
- a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;
- a management layer configured for provisioning of the integrated Web Services and for monitoring and administration of the integrated Web Services;
- a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Services;
- a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and
- an Open Standards layer.

82. (Previously presented) A computer-accessible storage medium storing program instructions, wherein the program instructions are computer-executable to implement:

- identifying one or more logical components of an integrated Web Service architecture for implementing a specific integrated Web Service business system according to one or more use case requirements for the specific

integrated Web Service business system, wherein each use case requirement specifies a particular business scenario for the integrated Web Service business system;

translating the one or more use case requirements for the specific integrated Web Service business system and one or more technical constraints for the specific integrated Web Service business system to determine a plurality of Web Service components for the integrated Web Service architecture, wherein the Web Service components include software components;

categorizing the Web Service components into two or more related groups according to a Web Services architecture integration framework;

defining a plurality of integration tiers for the integrated Web Service architecture and one or more Web Services technologies for the integrated Web Service architecture according to a Web Services architecture integration framework;

defining how each of the plurality of integration tiers communicates with others of the plurality of integration tiers in the integrated Web Service architecture according to the Web Services architecture integration framework;

organizing the groups of Web Service components according to the plurality of integration tiers and two or more layers of the integrated Web Service architecture; and

applying one or more design patterns to the integrated Web Service architecture, wherein the one or more design patterns include one or more Web Services integration design patterns for integrating Web Services with business systems; and

providing output indicating the generated integrated Web Service architecture for implementing the specific integrated Web Service business system.

83. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the integrated Web Service architecture comprises:

a service provider configured to provide one or more services on the integrated Web Service business system implemented according to the integrated Web Service architecture; and

one or more service requesters configured to access the one or more services from the service provider via a network.

84. (Previously presented) The computer-accessible storage medium as recited in claim 83, wherein the integrated Web Service business system is a Business-to-Consumer system, wherein the service provider is a business service provider, and wherein the service requester is an end user.

85. (Previously presented) The computer-accessible storage medium as recited in claim 83, wherein the integrated Web Service business system is a Business-to-Business system, wherein the service provider is a business service provider, and wherein the service requester is a business server.

86. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the two or more layers of the integrated Web Service architecture comprise two or more of:

a network layer configured to serve as an underlying network for Web Services implemented according to the integrated Web Service architecture;

a transport layer for delivering messages between components of the integrated

Web Service architecture;

a service description language layer configured to describe service type and functionality of the integrated Web Service architecture;

a transaction routing layer configured to route messages on the transport layer;

a service discovery layer configured to search for and locate services in the integrated Web Service architecture;

a service negotiation layer configured to negotiate exchanges between service requesters and service providers implemented according to the integrated Web Service architecture;

a management layer configured for provisioning of the integrated Web Service architecture and for monitoring and administration of the integrated Web Service architecture;

a Quality of Service layer configured to provide reliability, scalability, and availability for the integrated Web Service architecture;

a security layer configured to provide authentication, entitlement, and non-repudiation security on the transport layer; and

an Open Standards layer.

87. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the specific integrated Web Service business system is an Enterprise integrated Web Service.



88. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the specific integrated Web Service business system is a Cross-Enterprise integrated Web Service.

89. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the plurality of Web Service components of the integrated Web Service architecture include one or more legacy mainframe systems.

90. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the program instructions are further computer-executable to implement defining integration of one or more Enterprise Application Interface (EAI) products with the one or more Web Services technologies.

91. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the plurality of integration tiers comprises a client tier, a presentation tier, a business tier, an integration tier, and a resources tier.

92. (Previously presented) The computer-accessible storage medium as recited in claim 82, wherein the one or more Web Services integration design patterns include one or more of:

an Application-to-Application design pattern;

a Standard Build design pattern;

a Hub-Spoke Replication design pattern;

a Federated Replication design pattern;

a Multi-Step Application integration design pattern;

- a Data Exchange design pattern;
- a Closed Process integration design pattern;
- an Open Process integration design pattern;
- a Service Consolidation–Broker integration design pattern; and
- a Reverse Auction–Broker integration design pattern.